

# Technology Opportunity

## Aircraft Anti-Icing and Deicing Using Ultrasound Technology

Although several technologies are currently used to protect aircraft from ice buildup, none of these provide for a lightweight, cost-effective ice-protection system. Ultrasonic technology, however, has the potential to provide the aviation community with such a system.

### Potential Commercial Uses

Ultrasonic technology being developed by the National Aeronautics and Space Administration (NASA) Lewis Research Center has great potential to protect the aviation community from airframe ice. In addition, this technology could be developed for the automotive, marine, and any other industry that would like to break the adhesive bond between two materials. Some potential uses include

- Airframe ice protection
- Automobile windshield ice protection
- Ice buildup protection for marine vessels



Ice testing on aluminum sheet.

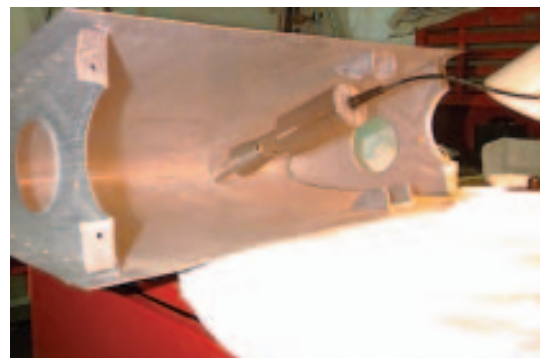
- Refrigerator and freezer frost removal
- Removal of mussels and other ocean life from marine vessels
- Elimination of material buildup in crucibles

### Benefits

- Inexpensive components provide lightweight, cost-effective ice protection for commercial and general aviation (private aircraft)
- More efficient automobile windshield deicing
- Safer winter shipping operations (avoids hazardous increased weight on hull caused by ice buildup)
- Environmental benefit of reduced use of anti-icing fluids

### The Technology

Sound waves create a stress field in a material. If this stress field is great enough at the interface of two materials, debonding begins. Current research is focused on debonding ice from aluminum. This research has shown that the debonding of a 0.032-in.



Wing demonstration unit.



aluminum plate and ice occurs within one second. Future investigations will include composites, glass, and steel.

### Options for Commercialization

- Process for obtaining a patent has been initiated.
- Future licensing of the technology could be made available.

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### Key Words

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